Katedry genetiky a biochémie PriF UK
a občianske združenie *NATURA*

Vás pozývajú na 86. prednášku v rámci Kuželových seminárov:

Prof. Wolfgang Löffelhardt

University of Vienna, Max F. Perutz Laboratories
Department of Biochemistry and Cell Biology

Plastid evolution: Lessons from the completed genome of the glaucophyte alga *Cyanophora paradoxa*

ktorá sa uskutoční **8. júna 2012** (piatok) o **14:00**

v miestnosti **CH1-222** Prírodovedeckej fakulty UK

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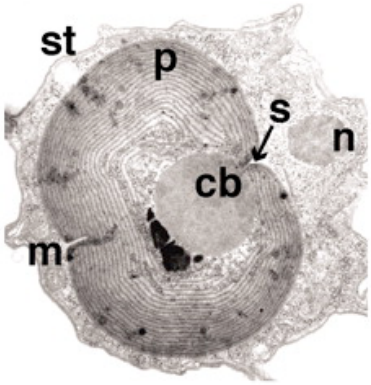
Hostiteľ: J. Krajčovič, Katedra genetiky PriF UK

Prof. Wolfgang Löffelhardt received a Ph.D. in Chemistry and Physics from the University of Vienna in 1972. In 1982, he achieved "habilitation" in Biochemistry and was appointed to Associate Professor in 1991. From the very beginning, his research interests were in plastid evolution. The flagellated protist, *Cyanophora paradoxa* with its peculiar plastids ("cyanelles") is his favorite organism. Over the years, the cyanelle genome was characterized, the fine structure of the unique eukaryotic peptidoglycan was determined and a primordial protein import apparatus was studied in collaboration with colleagues from Germany, the US, Spain, and France. Since his retirement end of 2008 he is involved in the consortium analyzing the nuclear genome of *C. paradoxa*.



Synopsis of the lecture: *Cyanophora paradoxa* (Glaucocystophyta) is a photosynthetic protist, which has served for many years as a model organism for plastid evolution. A peptidoglycan wall surrounding the plastids is a clear indication of their origin from endosymbiotic cyanobacteria. Phylogenetic analyses of nuclear and plastid genes point towards a single primary endosymbiotic event, i.e., monophyly of the kingdom "Plantae". As an additional unique cyanobacterial feature found only in Glaucocystophyta, carboxysomes were discussed, whereas all other algae contain the CO_2-fixing enzyme Rubisco in microcompartments called pyrenoids. Analysis of the recently completed genome led to some surprising results. While all enzymes of peptidoglycan biosynthesis were found, the carboxysome hypothesis could not be verified. Phylogenomic analyses further corroborated Plantae monophyly. However, it is not appropriate any longer to consider *C. paradoxa* as „primitive" or as „living fossil", since it contains considerably more genes than the green alga *Chlamydomonas reinhardtii* and appears to be very versatile concerning metabolic pathways. The genome conforms to the case of a „genetic mosaic", typical for eukaryotes.

Recent Publications

Price DC, Chan CX, Yoon HS, Yang EC, Qiu H, Weber APM, Schwacke R, Gross J**,** Blouin NA, Lane C, Reyes-Prieto A, Durnford DG, Neilson JAD, Lang BF, Burger G, Steiner JM, **Löffelhardt W**, Meuser JE, Posewitz MC, Ball S, Arias MC, Henrissat B, Coutinho PM, Rensing SA, Symeonidi A, Doddapaneni H, Green BR, Rajah VD, Boore J and Bhattacharya D (2012) *Cyanophora paradoxa* genome elucidates origin of photosynthesis in algae and plants. *Science* 335, 843-847.

Löffelhardt W (2011) The chlorarachniophyte nucleomorph is supplemented with host cell nucleus-encoded histones. *Mol Microbiol* 80, 1413–1416.

Steiner JM and **Löffelhardt W** (2011) The Photosynthetic Apparatus of the Living Fossil, *Cyanophora paradoxa*. In: (Peschek GA et al, eds) *Bioenergetic Processes of Cyanobacteria*, pp. 71-87, Springer Science+Business Media B.V., Dordrecht.